

# Tornadoes Student Activity Book

## I. Introduction

Have you ever seen a tornado? Hopefully, it was in a video on television. Each year as many as 1000 tornadoes may occur in the United States. Their destruction can range from minor to devastating. Although about 100 people are killed each year by tornadoes, many more people survive unharmed. By knowing what to do you can greatly decrease your chances of getting hurt. This activity will introduce you to the history of tornado forecasting, tornado formation and tornado safety.

### **Get Info Objectives**

1. Describe when and where most tornadoes form.
2. Explain tornado watches and warnings and how to respond.
3. Describe what tornadoes look like.

### **Gather Data Objectives**

1. Learn about the first tornado forecast.
2. Learn about the Fujita scale for rating tornadoes: what each category means and which ratings are most commonly given.
3. Learn how to calculate percentages.

## Application Objectives

1. Consider the impact the first tornado forecast had on saving lives.
2. Discuss the importance of following safety plans given the amount of damage done by most tornadoes.
3. Describe why it is unlikely an F6 rating will ever be assigned to a tornado.

- From the main screen, click "Get Info."

## II. Get Info

### A. Occurrence

- Click on the "Preparedness Guide" site.
- Go to the top of the page.
- Scroll down to "Tornado!".
- Read the information and answer the following questions.

1. Describe where most United States tornadoes occur.

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2. What time of year do most tornadoes form in the United States?

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3. Describe the most violent tornado in terms of wind speed and size of the damage path.

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## B. Variations

- Scroll down the site to the "Tornado Variations" section.

1. a) Are tornadoes always easy to see? \_\_\_\_\_

b) What happens to make them become visible? \_\_\_\_\_

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2. What is a tornado over water called? \_\_\_\_\_

- Scroll down the site to the "Tornadoes Take Many Shapes and Sizes" section.

3. Which tornadoes occur most often: weak, strong, or violent?

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4. Most tornado deaths are caused by violent tornadoes. Violent tornadoes represent what percent of all tornadoes? \_\_\_\_\_

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### C. Awareness and Safety

- Scroll down the site to the "Frequency of Tornadoes" section.

1. What time of day are tornadoes most likely to occur?

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Click on "Months of Peak Tornado Occurrence"

2. During which months are tornadoes most likely to occur in your state?

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- Scroll down the site to the section "What to listen for..."

3. a. What is a tornado watch?

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b. What should you do when a watch is issued for your area?

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4. a. What is a tornado warning?

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b. What should you do when a warning is issued for your area?

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- Scroll down to "Environmental Clues"

5. What are the signs that a tornado might form?

a) \_\_\_\_\_

b) \_\_\_\_\_

c) \_\_\_\_\_

d) \_\_\_\_\_



- Scroll down to "Tornado Safety"

6. How do you prepare before the storm?

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7. How do you keep yourself informed when there is bad weather?

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8. If a warning is issued for your county you need to take shelter. Where would you go if you were:

a. at school?

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b. at home?

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c. in a car?

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- Click the "Back" button at the top of the screen in your web browser until you get back to the OAR Tornado main screen.



- Click "Gather Data."

### III. Gather Data

#### A. The First Tornado Forecast



- Click on the "Golden Anniversary" site.
- Scroll down to "Historical Events" and click on "Description of Historical Events."



- Scroll down to "March 20, 1948."
- Read the information and answer the following questions.



1. What happened at 10 p.m. on March 20, 1948?

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- Scroll down to "March 21, 1948."

2. On March 21, 1948, the Investigative Board decided that tornadoes could not be forecast, given the current state-of-the-art. What did they recommend?

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- Scroll down to "March 22-24, 1948."

3. What did Fawbush and Miller study over the next three days?

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- Scroll down to "March 25, 1948."

4. What happened at 2:50 p.m. on March 25, 1948?

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5. Later that night, what happened for the second time in five days?

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6. The first tornado forecast led to what?

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## B. Tornado Statistics



- Click on the "Fujita Scale" site.
- Look at the two pie charts and read the descriptions.



1. What years of data are these statistics made from?

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2. What percentage of all tornadoes are considered:

a. weak? \_\_\_\_\_

b. strong? \_\_\_\_\_

c. violent? \_\_\_\_\_

3. Did the number of people killed by tornadoes increase or decrease after 1950?

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- Scroll down to "The Fujita Scale"

4. What kinds of damage are typical of these tornadoes?

a. weak (F0 and F1) ? \_\_\_\_\_

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b. strong (F2 and F3)? \_\_\_\_\_

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c. violent (F4 and F5)? \_\_\_\_\_

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- Click "Back" until you get back to the OAR Tornado Gather Data site.

### C. Decoding the Dallas County Texas Tornado Statistics Summary



- Click on "All Tornado Statistics".



1. What years of data were used for the first step?

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- Scroll down to the map of the United States



- Click on Texas.



- Scroll down to Dallas County



2. Of the 66 tornadoes, tally with hatch marks how many were:

F0: \_\_\_\_\_

F1: \_\_\_\_\_

F2: \_\_\_\_\_

F3: \_\_\_\_\_

F4: \_\_\_\_\_

F5: \_\_\_\_\_

3. Add your totals as shown below into weak, strong, and violent categories:

weak ( $F0 + F1$ ): \_\_\_\_\_

strong ( $F2 + F3$ ): \_\_\_\_\_

violent ( $F4 + F5$ ): \_\_\_\_\_

4. Now calculate what percentage each category represents of the total number of tornadoes (hint: divide the number in the category by the total, 66, and multiply by 100):

weak: \_\_\_\_\_

strong: \_\_\_\_\_

violent: \_\_\_\_\_



- Click "Back" until you get back to the OAR Tornado Gather Data site.
- Click "Application."

## IV. Application

### A. Apply What You Learned About Tornadoes



1. Look at your answers to the questions in sections A and B of Section III. Write a possible explanation for the dramatic decrease in deaths after 1950.

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2. Safety plans emphasize going to the basement or interior closet, bathroom, or hall in a permanent structure during a tornado warning. Review the damage descriptions for the vast majority of all tornadoes (F0 to F3) and discuss why it is important to follow safety plans.

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3. An F6 rating has never been assigned to a tornado. Why is it unlikely a tornado will ever be given an F6 rating?

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## V. Enrichment Activities

### A. You are the Mayor

1. How will your town's emergency management staff have prepare if your town is in a tornado watch? What if your town is actually hit by a tornado? List potential duties for each group of emergency personnel:
  - a. civil defense coordinator
  - b. storm spotters
  - c. ambulance drivers
  - d. fire fighters
  - e. police
  - f. sanitation workers



### B. You are the Local Civil Defense Coordinator

1. Develop a public awareness plan to inform people what to do during tornado watches and warnings, and after a tornado hits. Include television, newspaper, and radio messages.
2. Develop a plan to make mobile home parks safer. Where should people in mobile homes go when they hear a warning?



### C. You are the Principal of a School

1. Design a tornado safety plan for the school. Include the months that are most likely to produce tornadoes. Describe what the students should do when there is a tornado warning.

2. Design a tornado safety plan for sporting events and other outdoor events at your school. Include considering who will stay aware of watches and warnings during the game/event, where people should go, and how much time might be needed to move everyone to a safe place.



#### **D. You are the Meteorologist**

1. Tornadoes are currently assigned ratings based on the damage they do to man-made structures. Engineers and meteorologists worked together to study the amount of wind necessary to do different kinds of damage to buildings yet many tornadoes occur in farm fields, forests, and other similar places and never hit anything man-made. Devise a plan for rating such tornadoes.


#### **E. Local Tornado Data**



- Click on the "Storm Events" site.
- Select your state and click on "Continue."
- Change "Begin Date" to "06/01/1995"
- Change "End Date" to "06/30/1995"
- Click on the "List Storms" button on the right side of the screen.
- Count the number of tornadoes for your state for June 1995.



1. How many tornadoes were reported?
2. Click on the "Location or County" to see a description of each tornado event. What kinds of damage did the tornadoes do?

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3. How often were other kinds of weather were reported:
    - A. Thunderstorm winds, Severe thunderstorm winds, Microbursts?
    - B. Flood/Flash flood/Urban flood?
    - C. Lightning?
    - D. Hail?
    - E. Heat/Cold/Drought?
  4. Which type of weather event was most common for your state in June 1995?

#### **F. Related Web Sites**

1. SPC Severe Storm Statistics  
<http://www.spc.noaa.gov/products/svrstats.html>
2. National Severe Storms Laboratory  
<http://www.nssl.noaa.gov/>
3. Storm Data and Unusual Weather Phenomena  
<ftp://ftp.ncdc.noaa.gov/pub/data/nexrad/sd9604.pdf>